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Remarks

Reconsideration of the application is respectfully requested in view of the foregoing amendments requested to be entered under 37 CFR § 312 and the following remarks. Claims 1-10 and 20-27 are pending in the application. Claims 1, 20 and 27 are independent.

Summary of Examiner Interview on May 14, 2004

The attorney of record, Stephen A. Wight, as a duly authorized representative of the applicants, conducted an interview with Examiner Haresh Patel on May 14, 2004. The subject of the interview comprised the patentability of pending claims 1-10, and 20-27. The discussion began with an amendment proposed by Examiner Patel via a facsimile sent to Mr. Wight on May 13, 2004. Mr. Wight and the Examiner reached an agreement over the phone about the claim language that could put the pending claims in condition for allowance.

Thus, Mr. Wight agreed to send a facsimile of a proposed amendment for claim 1 that would reflect the claim language agreed upon during the interview. Examiner Patel indicated that he would seek approval of such a proposed amendment from his Supervisor. In response, Mr. Wight indicated that he would then agree to allow the Examiner to enter the changes to claim 1 and the rest of the claims as appropriate according to the language to be proposed via facsimile. Such language was sent by a facsimile addressed to Examiner Haresh Patel on May 14, 2004. See attached Exhibit A.

Summary of Examiner Interview on July 15, 2004

The attorney of record, Stephen A. Wight, contacted Examiner Patel on July 15, 2004 in response to a notice of allowance dated June 3, 2004. In the notice of allowance, the Examiner indicated that all claims pending at the time (i.e., claims 1-10 and 20-27) and as amended by the Examiner's amendment as allowed. Although, permission had been given my Mr. Wight to enter Examiner's amendment during the May 14, 2004 interview, the permission was based on the proposed amendment sent via facsimile to the Examiner on the same day. See attached Exhibit A. However, the Examiner's amendment was substantially different than what was agreed to by Mr. Wight for the applicants.

Thus, during this interview on July 15, 2004 Mr. Wight objected to the Examiner's amendment. The Examiner acknowledged the differences in the amendment that was actually agreed upon and what was actually entered by him. Thus, during this interview both the Examiner

PAGE 8/20 * RCVD AT 8/25/2004 7:06:57 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/2 * DNIS:8729306 * CSID:503 228 9446 * DURATION (mm-ss):05-46

and Mr. Wight agreed that a new proposed amendment would be sent via facsimile and that the Examiner would enter those amendments. Accordingly, a facsimile with the proposed amendments were sent on July 15, 2004. Examiner Patel, however, called back the same day (July 15, 2004) to propose one small change, which was agreed to and a final version of the proposed amendment was sent via facsimile at a later time on July 15, 2004. See attached Exhibit B.

Request for Entry of Amendment under 37 CFR § 312

Applicants respectfully request that the attached amendment be entered under 37 CFR § 312. As noted above, in the summary of the Examiner interview conducted on May 14, 2004, the applicants had agreed to Examiner's amendments to the pending claims so long as it was based on the language as shown in the attached copy of the facsimile sent to Examiner Patel just after the interview on May 14, 2004. See attached Exhibit A. However, the actual amendments entered by the Examiner in his amendment went well beyond what the Applicants had agreed upon.

Thus, the attached amendment is being submitted to be entered to reflect the latest agreement on amendments with Examiner Patel after the July 15, 2004 interview. These amendments are exactly the same as the proposed amendments submitted to Examiner Patel via facsimile on July 15, 2004. See attached Exhibit B. The Applicants believe that these amendments accurately reflect the agreement reached between Mr. Wight and Examiner Patel on July 15, 2004. The Applicants kindly request entry of the attached amendments.

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Conclusion

The claims in their present form should now be allowable. Such action is respectfully requested.

Respectfully submitted,

KLARQUIST SPARKMAN, LLP

By _____
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Docketing

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FAX TRANSMITTAL

DATE:	May 14, 2004
TO:	Examiner - Haresh Patel
FAX PHONE:	703-746-6222
FROM:	Sunjay Y. Mohan for Stephen Wight
RE:	APPLICATION PROGRAMMING INTERFACE ENABLING APPLICATION PROGRAMS TO GROUP CODE AND DATA TO CONTROL ALLOCATION OF PHYSICAL MEMORY IN A VIRTUAL MEMORY SYSTEM (App. Ser. No. 09/602,300)
OUR FILE:	3382-55510-01
YOUR FILE:	App. Ser. No. 09/602,300
NO. PAGES	2 (including this cover page)

PLEASE ACKNOWLEDGE RECEIPT BY RETURN FACSIMILE? ☐Yes ☐No

CONFIRMATION TO FOLLOW? ☐Yes ☐No

CONTACT INFO: If you do not receive all pages or if you have problems receiving transmittal, please call us at (503) 226-7391 as soon as possible and ask for Sunjay Y. Mohan.

MESSAGE: Examiner Patel we thank for your kind consideration of the attached proposed amendment.

EXHIBIT A

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Proposed amendment for discussion purposes

Per discussion held with Examiner Patel on May 14, 2004, applicants would agree to Examiner's amendment to claim 1 as in the following marked-up version of claim 1.

Claim 1:

In a multitasking operating system that uses virtual memory to share physical memory among concurrently executing application programs, a method for controlling allocation of physical memory comprising:

in response to a call from an application program, other than an operating system, to group specified code or data in a group, creating a structure to group the code or data specified by the application;

monitoring for a not-present interrupt generated by a virtual memory system in response to a request to access any part of the code or data in the group; and

when the not-present interrupt occurs for a unit of memory in the group, loading all of the code or data in the group that is not already in physical memory into physical memory from secondary storage at one time by a single series of loading operations without further non-present interrupts being generated for another unit of memory in the group, including loading the unit of memory for which the not-present interrupt has occurred and all other units of memory used to store the code or data in the group.

EXHIBIT A

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Facsimile: 503-228-9446

FAX TRANSMITTAL

DATE: July 15, 2004

TO: Haresh N. Patel

FAX PHONE: (703) 746-6222

FROM: Sunjay Y. Mohan

RE: APPLICATION PROGRAMMING INTERFACE ENABLING APPLICATION PROGRAMS TO GROUP CODE AND DATA TO CONTROL ALLOCATION OF PHYSICAL MEMORY IN A VIRTUAL MEMORY SYSTEM

OUR FILE: 3382-55510-01

APP. SER. NO.: 09/602,300, filing date of June 23, 2000

NO. PAGES 6 (including this cover page)

PLEASE ACKNOWLEDGE RECEIPT BY RETURN FACSIMILE? ☐Yes ☐No

CONFIRMATION TO FOLLOW? ☐Yes ☐No

CONTACT INFO: If you do not receive all pages or if you have problems receiving transmittal, please call us at (503) 226-7391 as soon as possible and ask for Kathryn L. Pundt.

MESSAGE: Examiner Patel,

As we discussed earlier today, please find the attached proposed amendment. We again thank you for your kind consideration of the attached proposed amendment. If you find the attached amendment acceptable, please proceed to enter the amendment as an Examiner's Amendment.

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Claims

1. (Currently amended) In a multitasking operating system that uses virtual memory to share physical memory among concurrently executing application programs, a method for controlling allocation of physical memory comprising:

in response to a ~~program~~ call from an application program, other than an operating system, ~~create a data structure~~ to group said application specified code or data in a group, creating a structure to group the code or data specified by the application;

monitoring for a not-present interrupt generated by a virtual memory system used by ~~of~~ said multitasking operating system in response to a said application request to access any part of the code or the data in the group; and

when the not-present interrupt occurs for a unit of memory in the group, loading all of the code or the data in the group that is not already in the physical memory into the ~~said~~ physical memory from secondary storage at one time, using a single series of loading operations without further not-present interrupts being generated by the ~~said~~ virtual memory system for another unit of memory in ~~said~~ the group, ~~and said~~ the loading including the unit of memory for which the not-present interrupt has occurred and all other units of memory used to store the code or the data in the group.

2. (Currently Amended) The method of claim 1 wherein the structure includes a linked list structure that links together the code or the data stored at non-contiguous portions of the virtual memory.

3. (Currently Amended) The method of claim 2 wherein the structure links pages of memory associated with the non-contiguous portions of the code or the data.

4. (Currently Amended) The method of claim 1 further including:
repeating the steps of claim 1 for additional groups of the code or the data specified by the application.

5. (Currently Amended) The method of claim 4 further including:

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EXHIBIT B

repeating the steps of claim 1 for a group of code or data for another concurrently executing application such that more than one concurrently executing application program has specified at least one group of code or data to be treated as a single piece of memory for loading into the physical memory in response to [a] the not-present interrupt.

6. (Original) The method of claim 1 further including:

when the not-present interrupt occurs, checking whether the interrupt has occurred for a unit of memory in the group by evaluating whether an address of the memory request for which the interrupt occurred is within a series of non-contiguous memory addresses of the group.

7. (Currently Amended) The method of claim 1 further including:

tracking memory accesses to units of memory in the group together such that when a unit of memory in the group is accessed, all of the units of memory in the group are marked as accessed; and

determining which portions of the physical memory to swap from the physical memory to the secondary storage by determining which units of [code] memory are marked as accessed, such that the units are selected to be swapped from the physical memory to the secondary storage based on frequency of use or how recently the units of [code] memory have been accessed.

8. (Currently Amended) The method of claim 7 further including:

in response to a second call from the application program to group specified code or data in a second group, creating a second structure to group the code or data specified by the application;

tracking memory accesses to units of memory in the first and second group such that when a unit of memory in both the first and the second group is accessed, all of the units of memory in the first and the second group are marked as accessed and the unit of memory in both the first and the second group is marked as being accessed twice.

9. (Currently Amended) The method of claim 8 further including:

when a block of code or data shared between two or more groups is accessed, marking the block as being accessed n times where n is the number of groups that share the block.

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10. (Currently Amended) A computer-readable medium storing instructions for performing the steps of ~~a method recited in~~ the method of claim 1.

11. (Canceled)

12. (Canceled)

13. (Canceled)

14. (Canceled)

15. (Canceled)

16. (Canceled)

17. (Canceled)

18. (Canceled)

19. (Canceled)

20. (Currently Amended) A computer-readable medium having stored thereon a data structure used for virtual memory management in a multitasking operating system, comprising:

a series of data fields forming a group for indicating blocks of code or data specified by a ~~program~~ call by an application to be treated as a single unit for purposes of virtual memory management, the data fields including a list of memory addresses of the blocks and sizes of each block in the list;

wherein the data structure is evaluated in a data processing operation to load each of the blocks into physical memory whenever a not-present interrupt is generated by ~~said~~ the virtual memory system in response to said application request for any memory address referring to a

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location included in one of the ~~said~~ blocks;

wherein the loading of the blocks into physical memory is performed at one time, using a single series of loading operations without further ~~non-present~~ not-present interrupts being generated by said virtual memory system for another unit of memory in ~~said~~ the group.

21. (Currently Amended) The computer readable medium of claim 20, wherein the list of memory addresses is an array of pointers to the blocks of memory to be placed in the group.

22. (Previously Presented) The computer readable medium of claim 20, wherein the sizes of each block in the list is indicated in an array of parameters.

23. (Currently Amended) The computer readable medium of claim 20, wherein the data structure is used to derive a linked list structure for keeping track of pages used to store the code or the data associated with the group as specified by the application.

24. (Previously Presented) The method of claim 1 further comprising, in response to a second call from the application program to further add units of memory to the group, adding the units of memory to the data structure as specified by the application.

25. (Previously Presented) The method of claim 1 further comprising, in response to a second call from the application to delete specified units of memory from the group, deleting the units of memory specified by the application from the data structure.

26. (Previously Presented) The method of claim 1 further comprising, in response to a second call from the application to destroy the group, destroying the data structure previously used for creating the group.

27. (Currently Amended) In a multitasking operating system that uses virtual memory to share physical memory among concurrently executing application programs, a virtual memory management system comprising:

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means for creating a data structure to group code or data specified by one of the concurrently executing applications ~~in a group~~, in response to a ~~program~~ call from the application other than an operating system to group the specified code or data;

means for monitoring for a not-present interrupt generated by [a] the virtual memory system of ~~said~~ the multitasking operating system in response to a ~~said~~ application request to access any part of the code or the data in the group; and

means for, when the not-present interrupt occurs for a unit of memory in the group, loading all of the code or the data in the group that is not already in the physical memory into said physical memory from secondary storage at one time, using a single series of loading operations without further ~~non-present~~ not-present interrupts being generated by ~~said~~ the virtual memory system for another unit of memory in ~~said~~ the group, ~~and said~~ the loading including the unit of memory for which the not-present interrupt has occurred and all other units of memory used to store the code or the data in the group.

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